

Development and Validation of a questionnaire to assess attitude to bite avoidance measure amongst travellers to malaria endemic areas

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BACKGROUND

Bite avoidance measures against mosquitoes are an important element of protection for travellers against malaria and other mosquito born diseases. Although it is recognised that adherence to such measures can be poor, there have been few studies that have examined the reasons for advice on bite avoidance not being followed by travellers when visiting malaria endemic areas. We describe the validation of a questionnaire to explore traveller's opinions of bite avoidance measures and present the results of two pilot studies.

THE DEVELOPMENT AND VALIDATION PROCESS

The factors that might influence traveller's perceptions of bite avoidance measures were identified from the literature. These were categorised under two broad headings; repellents applied to the skin, clothing/clothing treatment, and measures taken on retiring.

To ensure that the questionnaire contained questions representative of the areas of interest, and therefore has **content validity**, in-depth interviews with the following categories of people were conducted:

- Those who had previously travelled to malaria endemic areas
- Individual's planning to travel to malaria endemic areas for the first time
- Those who had no experience or were not planning to travel to malaria endemic areas

From the themes that emerged from the interviews, a questionnaire was constructed using closed question and Likert type scales. **Face validity** was examined through review of the questionnaire by practitioners (a nurse, pharmacist and physician) in travel medicine.

Reliability was assessed by the test re-test method in which the questionnaire was administered to 6 individuals and then re-administered two weeks later. The percentage agreement ranged from 70-100% for each question except relating to clothing insecticide treatment where it was lower at 50-80%. In all cases the difference was but one point on the 5-point Likert scale and mostly relating to "agree"/"strongly agree" options. Therefore the valence of the responses remained mainly the

same, i.e., there were few occasions where these individuals changed from “agree” to “disagree” response over the two-week period. Reliability was further investigated through pilot studies.

THE PILOT STUDIES

Three pilot studies were conducted:

Pilot study 1: The questionnaire was administered by a researcher to 30 travellers planning a trip to a malaria endemic area who visited a specialist travel store and medical centre in London, UK.

Pilot study 2: The questionnaire was given to 31 travellers planning a trip to a malaria endemic area who visited a specialist travel store and medical centre in Bristol, UK. In this study the participants completed the questionnaire in their own time and returned the questionnaire by post to a researcher

RESULTS

Few significant differences were observed in the responses for pilot study 1 and 2. Some of the results are presented to highlight the main negative perceptions regarding bite avoidance measures.

Figure 1 shows the bite avoidance measures that participants intended to take on the planned trip, combined from pilot 1 and 2. . In high risk areas such as SS Africa more than 20% of travellers did not plan to use repellents and 40% not to use any measures on retiring. **Figure 2** describes some of the main negative perceptions regarding bite avoidance measures.

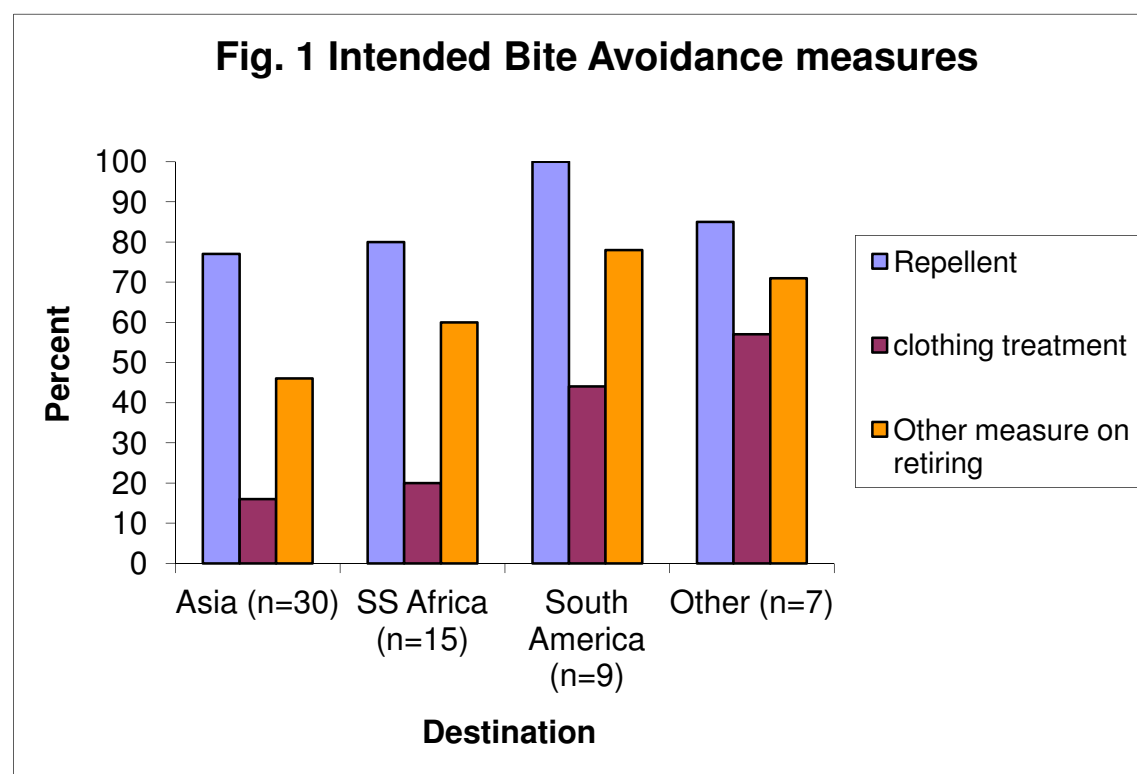


Fig 2. Percentage of participants who agreed/strongly agree with some statements on bite avoidance measures

	% Study 1 (N= 30)	%Study 2 (N=31)	%Total (N=61)
Using repellents is time consuming	20	21	21
Repellents are Cosmetically unacceptable	26	25	26
Repellents are Expensive	63	82	60 *
Repellents can be toxic/bad for the skin	43	60	52
Long sleeves / trousers are too hot to wear	63	67	65
Nets too stuffy to sleep under	17	27	21
Nets too troublesome	27	23	25
I don't like the smell of insecticide sprays	43	37	40

* Chi-Square = 10.770, DF = 2, P-Value = 0.005

CONCLUSION

The questionnaire should be assessed in larger studies for potential use as a tool for assessing perceptions of bite avoidance measures for those visiting malaria endemic areas. Some of the main negative perceptions were identified by the questionnaire.

Bite Avoidance Survey BTHA

2. About you and your trip

1. What is your gender

☐ male ☐ female

2. What is your age in years

☐ 18-30 ☐ 31-40 ☐ 41-50 ☐ 51-60 ☐ older than 60

3. How much advice did you receive before your trip regarding methods to avoid mosquito bites

☐ a lot ☐ some ☐ none at all

4. Name all of the countries that you travelled to on your recent trip overseas

5. For how long were you away

☐ less than 1 month
☐ 1-3 months
☐ more than 3 months

6. Have you travelled before this trip to an area where there is a risk of malaria

☐ Yes ☐ No

7. What was the purpose of your recent travel

☐ Visiting family and friends
☐ Business
☐ A package or other type of holiday staying at a single destination
☐ Backpacking or trekking
☐ Other (please specify)

Bite Avoidance Survey BTHA

3. mosquito bite avoidance measures

This section will ask about the various methods you may have used to avoid mosquito bites

Choices - frequently, sometimes never

1. Please describe your use of bite avoidance measures

Click on your choice

Did you stay in an air-conditioned room	<input type="text"/>
Did you use a mosquito net at night	<input type="text"/>
Did you wear clothing to cover arms when going out after dusk	<input type="text"/>
Wear trousers when going out after dusk	<input type="text"/>
Used an insect repellent on the skin while out after dusk	<input type="text"/>
Used an insecticide spray in your room	<input type="text"/>
Used a plug-in insecticide vapouriser	<input type="text"/>

If you used a repellent please give the brand and strength of all repellents used

2. If you used any other methods to avoid mosquito bites please describe

3. Did you get bitten by mosquitoes whilst away

☐ Many bites ☐ A few bites ☐ No bites

4. If you were bitten did you tend to take more measures to avoid bites

☐ Yes ☐ No

5. Did you take medication to prevent malaria whilst you were away

☐ Yes ☐ No

Bite Avoidance Survey BTHA

4. Your opinions

In this final section you will be asked your opinion of the various methods used to avoid mosquito bites

1. Your opinion of Mosquito Nets. Select whether you agree or disagree by clicking on the menu

Choices for this section are

	Strongly Agree	Select from the menu
Using mosquito nets can reduce the risk of malaria.	Agree	<input type="text"/>
Nets are too stuffy to sleep under	neither agree or disagree	<input type="text"/>
Nets are too troublesome	Disagree	<input type="text"/>
	Strongly Disagree	<input type="text"/>

2. Your opinion of insect repellents. Select whether you agree or disagree by clicking on the menu

	Select from the menu
Using repellents can reduce the risk of malaria	<input type="text"/>
Repellents are effective in preventing mosquito bites	<input type="text"/>
I don't need repellents if I am taking malaria tablets	<input type="text"/>
Repellents are unpleasant to use	<input type="text"/>
Repellents are toxic or bad for the skin	<input type="text"/>

3. Your opinion of clothing to prevent mosquito bites. Select whether you agree or disagree by clicking on the menu

	Select from the menu
Wearing long sleeve and trousers when outside at night reduces the risk of catching malaria	<input type="text"/>
Using insecticide sprays on clothes reduces mosquito bites	<input type="text"/>
Treating clothes with insecticide spray takes too much time	<input type="text"/>
Insecticide sprays applied to clothes can damage them	<input type="text"/>
Wearing long sleeves and trousers is too uncomfortable if it is hot outside at night	<input type="text"/>

4. Your opinion of other methods of avoiding mosquitoes after retiring. Select whether you agree or disagree by clicking on the menu

	Select from the menu
Keeping windows closed reduces mosquito bites	<input type="text"/>
Sleeping in an air conditioned room results in less mosquito bites	<input type="text"/>
Spraying the room with insecticide is a bad method of reducing insect bites	<input type="text"/>
Plug in insecticide vaporisers are a good way of avoiding mosquito bites	<input type="text"/>

5. Your opinion of malaria. Select whether you agree or disagree by clicking on the menu

	Select from the menu
Malaria is a severe condition	<input type="text"/>
Malaria is easily treated	<input type="text"/>
Malaria is not so common in travellers from the UK	<input type="text"/>
Avoiding mosquito bites reduces the risk of malaria	<input type="text"/>